Swietenia macrophylla

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Swietenia macrophylla King

Taxonomy and nomenclature

Family: Meliaceae

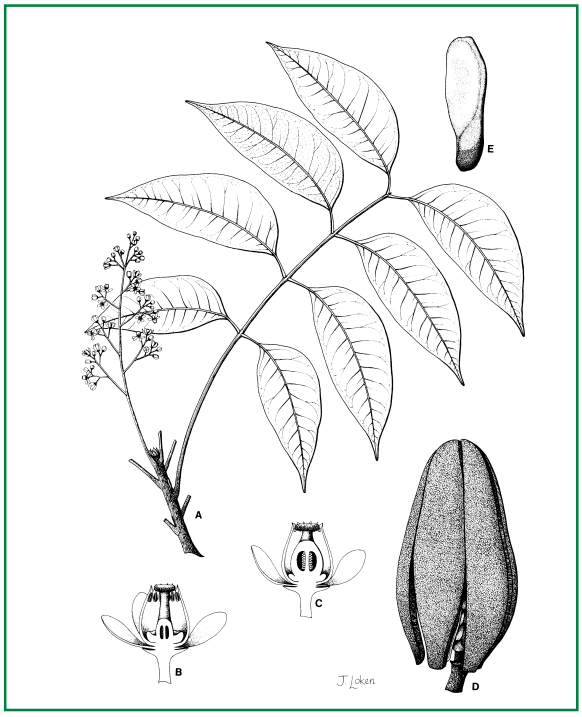
Synonyms: *Swietenia candolei* Pittier, *Swietenia krukovii* Gleason, *Swietenia belizensis* Lundel, *Swietenia macrophylla* King var. *marabaensis* Ledoux et Lobato, *Swietenia tessmanii* Harms.

Vernacular/common names: Honduras mahogany, big/broad/large leaved mahogany (Eng.); caoba (Sp.); echtes mahagoni (Germ.)

Related species of interest: The genus consists of two other species, *S. mahagony* and *S. humilis*. The three species are poorly defined biologically, in part because they hybridise freely.

Distribution and habitat

Humid zone species of the new world; widely distributed, natural as well as cultivated; native to Mexico (Yucatan), Central and northern South America (Amazon region). Extensively planted mainly in southern Asia and the Pacific; also introduced into West Africa.



A, flowering branchlet; B, male flower; C, female flower; D, fruit; E, seed. Illustrations by J. Loken from Pennington, T. D., 1981. Meliaceae, Flora Neotropica, 28. Used with permission.

Uses

Mahogany is one of the most valuable furniture timbers in the world due to the decorative and attractive timber with good technical characteristics. It is widely planted in the tropics in reforestation and afforestation programmes. In agroforestry systems it is used for shade and fuelwood.

Botanical description

Usually evergreen tree, up to 30-35 m. Bark grey and smooth when young, turning dark brown, ridged and flaky when old. Leaves up to 35-50 cm long, alternate, glabrous, paripinnate; 4-6 pairs of leaflets, each leaflet 9-18 cm long. Flowers small and white in large, 10-20 cm long, branching panicles.

Fruit and seed description

Fruit: dehiscent, usually 5-lobed capsule, erect, 12-15 (-22) cm long, greyish brown, smooth or minutely verrucose. Outer valves woody, 5-7 mm thick, inner valves much thinner. In the centre is a woody, 5 angled columella extending to the apex.

The fruits split open from apex or base when they are ripe and dry. Seeds are hanging from the columella by their wing, leaving conspicuous scars after their release. Usually 35-45 seeds per fruit.

Seed: brown, oblong, compressed, crested and extended into a wing at the attachment end, 7.5-15 cm long incl. wing with extensive air spaces. The seeds are dispersed by wind. There are 1800-2500 seeds per kg.

Flowering and fruiting habit

Flowers are unisexual and the tree monoecious. The flowers are pollinated by insects. Hybridisation is frequent, especially with *S. mahagoni* where the species grow together. Usually only one flower of the inflorescence develops into a fruit, the others being aborted. Development from flower to mature fruit takes 9-12 months. Flowering and fruiting are regular annual from 10 to 15 years of age but fruit set can be low due to lack of pollinators. The long development time for the fruit makes crop assessment possible several months before harvest. Flowering usually takes place when trees are leafless or just coming into new leaf shortly before the rainy season.

Some phenology data are summarised here:

	Flowering	Fruiting
Central and northern S. America	April-June	Jan-March
Southern S. America	Sept-Oct	July-Aug
British Virgin Is. and Puerto Rico	May-June	Sept-Oct
Costa Rica	March-April	Dec-Jan
Solomon Islands		June-Sept
Philippines	March-June	Dec-March

Harvest

The fruits are preferably collected from the trees just before they split open or from the ground immediately after seed fall. Seed production varies according to site and year. A crucial factor for seed production is pollination efficiency, which may be erratic especially outside the natural range of distribution. A mature tree of *S. macrophylla* can produce up to 200 mature fruits in a year or about 4.8 kg of seeds. However, usually the production is only 2.5 - 4 kg per tree for trees with fairly exposed crowns.

Processing and handling

Mature dry fruits or dry seeds collected from the forest floor can be stored for some days in sacks without significant deterioration. However, in order to reduce bulk it is often preferable to initiate processing in the field. The fruits will split open when dried for 1-4 days, depending on maturity, after which the seeds are easily released by gentle shaking of the fruits. Fruit parts (valves and columella) are removed by hand. Further reduction of bulk by manual dewinging may be desired.

Storage and viability

Seed is orthodox and if stored at 3-7% moisture content at low temperatures (1-5°C), it will retain high viability for several years. If the seed is stored in paper bags at room temperature, 7-8 months storage can be expected without loss in viability. Initial moisture content in mature seeds is 9-12%. Germination percentage of fresh seeds is 60-90 %.

Pretreatment

Pretreatment is generally not necessary but germination of seeds with low moisture content may be enhanced by soaking in water for 12 hours.

Sowing and germination

Under test conditions seeds are germinated in sand at fluctuating 35-30°C or constant 30°C and 12/12 for 8/16 hours light /dark. In the nursery, seeds are sown in a bed of light sand in 3-7 cm deep furrows or holes or directly in containers. Germinating seeds should be kept moist and under shade. Seeds will germinate in 10-21 days. The seedlings are kept under shade until outplanting, which can take place when they are about 50-100 cm tall.

Selected readings

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Stem variation in *Swietenia macrophylla*. Philippines. Photo: Lars Schmidt, DFSC.

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